

Nanoengineered Hybrid Gas Sensors for Spacesuit Monitoring, Phase II

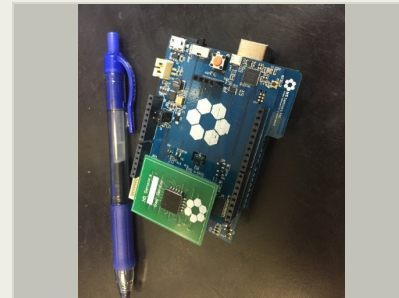
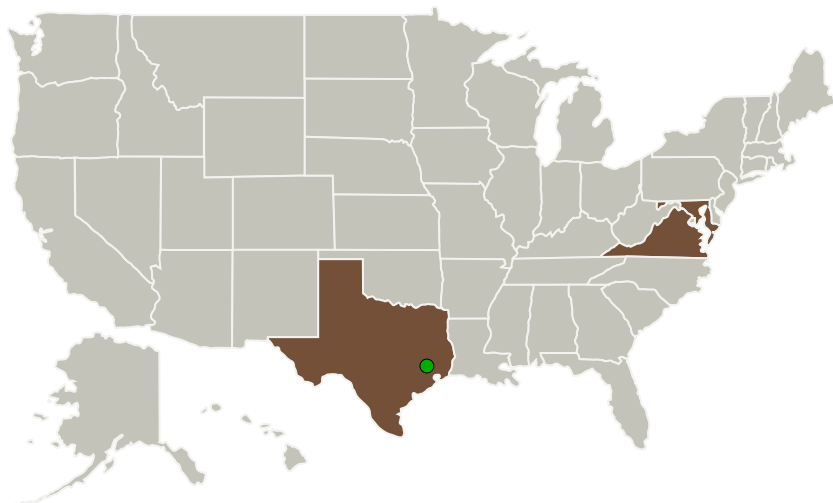
Completed Technology Project (2016 - 2018)



Project Introduction

Extravehicular Mobility Units (EVU) are the necessary to perform elaborate, dynamic tasks in the biologically harsh conditions of space and they have stringent requirements on physical and chemical nature of the equipment/components/processes, to ensure safety and health of the individual require proper functioning of its life-support systems. Monitoring the Portable Life Support System (PLSS) of the EVU in real time ensures the safety of the astronaut and success of the mission. In Phase I, N5 Sensors has demonstrated and manufactured an ultra-small form factor, highly reliable, rugged, low-power sensor architecture for carbon dioxide (CO₂) and ammonia (NH₃) that is ideally suited for monitoring trace chemicals in spacesuite environment in presence of humidity and oxygen. N5 will perform additional design refinements in Phase II and implement on-chip components for enhanced analytical and operational reliability. Additionally, a complete detector system will be designed, integrated with various electronic components and tested to determine system level performance and reliability. Subsequent design refinements will be done.

Primary U.S. Work Locations and Key Partners



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| Organizations Performing Work | Role | Type | Location |
|-------------------------------|-------------------------|-------------|----------------------|
| N5 Sensors, Inc. | Lead Organization | Industry | Germantown, Maryland |
| George Mason University | Supporting Organization | Academia | Fairfax, Virginia |
| ● Johnson Space Center(JSC) | Supporting Organization | NASA Center | Houston, Texas |

Primary U.S. Work Locations

| | |
|----------|-------|
| Maryland | Texas |
| Virginia | |

Project Transitions

▶ **December 2016:** Project Start

✓ **December 2018:** Closed out

Closeout Documentation:

- Final Summary Chart(<https://techport.nasa.gov/file/140893>)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

N5 Sensors, Inc.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

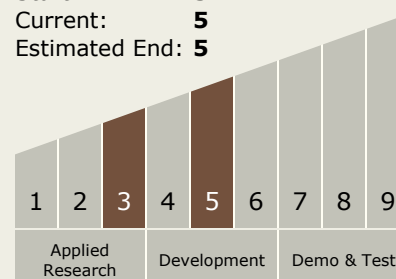
Carlos Torrez

Principal Investigator:

Ratan Debnath

Technology Maturity (TRL)

Start: 3
Current: 5
Estimated End: 5

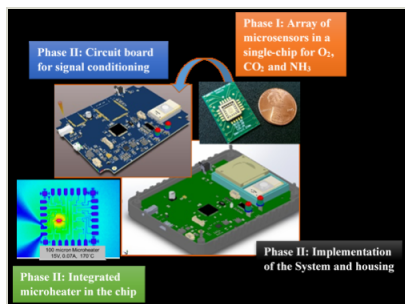


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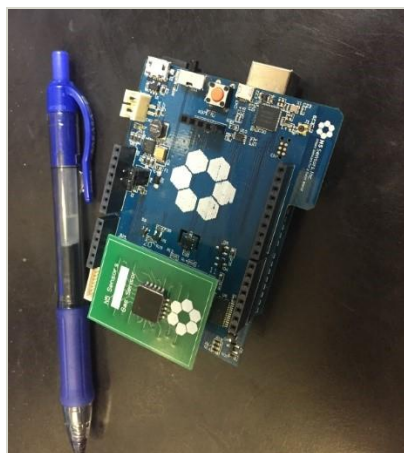
Images



Briefing Chart Image

Nanoengineered Hybrid Gas Sensors for Spacesuit Monitoring, Phase II

(<https://techport.nasa.gov/image/127620>)



Final Summary Chart Image

Nanoengineered Hybrid Gas Sensors for Spacesuit Monitoring, Phase II

(<https://techport.nasa.gov/image/132701>)

Technology Areas

Primary:

- TX06 Human Health, Life Support, and Habitation Systems
 - └ TX06.2 Extravehicular Activity Systems
 - └ TX06.2.2 Portable Life Support System

Target Destinations

The Moon, Mars, Outside the Solar System, The Sun, Earth, Others Inside the Solar System